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A National Environmental/Energy Workforce Assessment. Iowa

National Field Research Center, Inc, Iowa City, Iowa

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Environmental Protection Agency, Washington, D C

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A National Environmental/Energy Workforce Assessment

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16. ABSTRACT

This study is one of 70 volumes assessing the workforce needs (manpower needs) for pollution control and abatement in the United States for the five-year period of 1976 through 1981. Seven fields for pollution control — air, noise, pesticides, potable water, radiation, solid waste, and wastewater — are analyzed, together with energy-related programs currently accentuated by the national effort to solve energy supply problems.

Designed as Phase I of a three-phase program, the complete assessment includes the following volumes: one each for the 50 states, the District of Columbia, Puerto Rico, and the Virgin Islands; one for each of the ten EPA regions; a one-volume National Abstract; a volume on National Legislation; a volume on Business and Industry; and a four-volume National Summary. The information was gathered through extensive personal interviews with responsible federal, state, and local officials in every state; with officials of representative private industrial and commercial firms; and with representatives of national industrial and trade organizations.

Phase II will develop a broad national inventory of the entire range of post-secondary and higher education training offered in the pollution control and energy areas cited above, and Phase III will offer demonstrations for curriculum changes or modifications which appear necessary to assure an adequate and properly trained national environmental/energy workforce.

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State Planning	Energy Management		
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for

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Conducted by:

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PREFACE

This report presents existing workforce levels, training programs, and career potentials and develops staffing level projections (1976-1981) based on available information for the State of Iowa in the environmental pollution control areas of air, noise, potable water, pesticides, radiation, solid waste, waste water, and energy. This study was carried out for the United States Environmental Protection Agency by National Field Research Center of Iowa City, Iowa.

The information and data presented in this report were compiled in large part from extensive interviews with professionals working in the respective areas and were supplemented by telephone surveys and research.

FOREWORD

The material herein contains the information and data collected for eight individual pollution control inventories conducted for Iowa. The format includes workforce profiles, projections, growth and career potential for each of the areas investigated. Growth projections are necessarily based on best professional estimates developed from available information and represent what are felt to be realistic figures by experts in the respective areas. The pollution control areas considered by this study are as follows:

Air

Noise

Pesticides

Potable Water

Radiation

Solid Waste

Wastewater

Energy

National Environmental Energy Workforce Assessment

Phase I

IOWA

State Summary

I. AIR

The Iowa air pollution control program is the responsibility of the Air Quality Management Division within the Department of Environmental Quality (DEQ). In addition the Air Quality Commission has policy-making and rule-making authority. The State Hygienic Laboratory (SHL) provides assistance in air monitoring activities, and local air quality programs are conducted in Cedar Rapids and Des Moines.

A staff of 20 persons is employed by DEQ's Air Quality Management Division in both the Permits Section and the Surveillance and Compliance Section. In addition to Division personnel, SHL has five people involved in air pollution control, the Des Moines program employs six persons, and the Cedar Rapids program has an equivalent of 4.8 full-time employees. Engineers, physicists, chemists, and technicians are the most prominent professional categories.

Substantial workforce growth has occurred since 1973; as a result it is felt that a stable program exists and very little additional growth is expected. Division expansion will occur only in possible new program areas. Local programs cited budget limitations as restricting the hiring of at least one additional person. Positions to be filled will most likely be in the occupations noted above, with openings coming as a result of a 16 percent per annum turnover and 4 percent per annum growth.

II. NOISE

Iowa does not have a comprehensive noise control law and there is not currently a statewide noise program. The Department of Transportation's (DOT) Highway Division does attempt to control vehicular noise through design and construction techniques. Additionally nine cities in Iowa have enacted municipal noise control ordinances.

The Department of Environmental Quality would be the state lead agency in any noise control program, but no members of the staff are involved in noise matters at the present time. Four persons within DOT are active in noise studies and impact assessments. No information is available concerning the number of persons involved in local noise matters; generally local law enforcement personnel assume this responsibility.

No workforce growth or career potential is anticipated for Iowa noise programs. Greater concern with the environmental effects of noise and possible passage of a noise control law could alter these projections.

III. PESTICIDES

The status of Iowa as a leading agricultural state has caused a great deal of emphasis to be placed on pesticide use and control. Workforce needs have been altered dramatically by the Federal Environmental Pesticide Control Act.

Pesticide program responsibility rests jointly with the Iowa Department of Agriculture (DOA) and the Department of Environmental Quality (DEQ). The Laboratory Division of DOA and the Chemical Technology Commission and Land Quality Management Division of DEQ cooperate on pesticide matters. The Iowa State University Cooperative Extension Service has been active in applicator training.

A staff of 18 persons in DOA has been assisted by 20 agricultural product inspectors in pesticide testing, registration and control. Two persons within DEQ have been active in applicator certification and pesticide matters. It is estimated that 7,000 commercial applicators and 77,500 private applicators will be certified by the end of 1977.

Workforce projections indicate an increase of from four to eight pesticide investigators within DOA to meet state and federal law mandates. Growth over the next five years is expected in the private and commercial applicator categories, possibly reaching a total of 100,000. No determination of growth within DEQ could be made. Employment prospects for persons with agricultural training appear to be good in both the state and federal public sectors.

IV. POTABLE WATER

Primary responsibility for Iowa's potable water supply rests with the Water Quality Management Division of the Department of Environmental Quality (DEQ). The Health Engineering Division of the Department of Health has a very limited role in water supply matters.

DEQ's Water Quality Management Division has state responsibility for wastewater and water supplies. The Division has a staff of 58 persons whose functions are not always clearly separable into wastewater and water supply areas. A summary of DEQ staff involvement is contained under the Wastewater Section.

The Department of Health is primarily concerned with sampling and evaluations of private water supplies. Because the definition of public water supplies has been broadened by the Safe Drinking Water Act, the number of private water supplies has been decreased. It appears likely, however, that Department of Health will work with DEQ to continue its monitoring effort of many of these sources.

Presently a staff of 10 professionals work in the Health Engineering Division of the Department of Health. The job title of these persons is area sanitarian and only a small percentage of each one's time is devoted to private water supply work. As the Division assists DEQ in monitoring some small public supplies, guidelines developed by DEQ will need to be followed.

V. RADIATION

Iowa has had a very limited radiation protection program and, in fact, is the only state without controls on X-ray machines. The Solid Waste Disposal Commission and the Land Quality Management Division within DEQ have lead agency responsibility for radioactive material control. In 1976 the Interagency Coordinating Council on Radiation Safety was created to coordinate state radiation matters.

In the current fiscal year only one person at DEQ is engaged part-time in radiation control activity. The employee's major function involves a survey of possible unsafe disposal of radioactive waste in the state.

Because of Iowa's limited radiation program, career opportunities are likely to be minimal. The enactment of an X-ray use control law could result in the need for some technicians to carry out mandates of the law. Iowa has only one nuclear power facility at the present time, but if more are constructed the workforce potential in this area could also improve.

VI. SOLID WASTE

Solid waste management and control is an area of growing concern in Iowa. An effort to control land pollution and to increase recycling and recovery are largely responsible for the concern.

The Solid Waste Disposal Commission and the Land Quality Management Division have primary responsibility for developing and carrying out programs in this area. The Division has a staff of 12 full-time persons in its Surveillance and Compliance Section and the Permits Section. Chemists, civil engineers and environmental specialists are the most commonly represented professions.

Workforce needs within the Division have not been determined for various job categories. Growth throughout DEQ will lead to an eight percent per annum expansion in all areas. In the solid waste area, new personnel are most likely to be needed to carry out state responsibilities under the Resource Conservation and Recovery Act and the Toxic Substances Control Act. If significant growth does occur, most opportunities will be for planners, engineers, and persons skilled in resource recovery and recycling operations.

VII. WASTEWATER

Control of water quality in Iowa is crucial both for a variety of uses and the protection of aquatic life. Agricultural waste and non-point sources are the major water pollution problems. Within DEQ the Water Quality Commission and the Water Quality Management Division are responsible for water pollution control and water supply programs throughout the state. The State Hygienic Laboratory (SHL) and the Health Engineering Division of the Department of Health also have a role in these programs.

The Water Quality Management Division is divided into four Sections: Grants and Program Management, Planning, Permits, and Surveillance and Compliance. A staff of 58 persons makes this Division the largest in DEQ. Civil engineers, sanitary engineers and environmental specialists represent the bulk of the full-time personnel. Eight technicians, biologists and chemists from SHL are involved in water quality control.

Workforce in the water pollution and potable water fields has expanded noticeably in the past three years as a result of the 1972 Amendments to the Federal Water Pollution Control Act and the Safe Drinking Water Act of 1974. Because hiring adjustments for most of this legislation have been made, only an eight percent per annum growth rate is expected. Engineers, environmental specialists, and Section 208 planners are the occupations likely to be in greatest demand.

VIII. ENERGY

Iowa has few energy resources and, as a result, its major effort in this area concerns conservation, allocation and policy development. The Energy Policy Council was created in 1974 to coordinate energy matters in Iowa and to unify the state's approach and response to future energy problems.

The Energy Policy Council is a thirteen member policymaking unit and has a staff of seven full-time employees. Conservation, education and research represent the primary thrusts of current Council activity. No information is available on the workforce in private energy fields or utility operations.

Little workforce growth is anticipated because of budget limitations; the current unsettled state of the energy field also makes long range planning very difficult. Career potential in the public sector energy field is expected to be minimal unless fuel allocation regulations are re-imposed. The shortage of energy supplies and the need to conserve energy are expected to be the focus of Council activity over the next five years.

STATE OF IOWA - SUMMARY

National Environmental/Energy Workforce Assessment
Pollution Control & Abatement Personnel
Projected Workforce Requirements (1976-1981)

Environmental Area	1976	1977	1978	1979	1980	1981	%/annum growth (average)
AIR[1]	20	20	20	22	22	24	4%
NOISE[2]	4	4	4	4	4	4	0%
PESTICIDES[3]	18	19	21	23	24	24	6%
POTABLE WATER[4]	10	10	10	10	10	10	0%
RADIATION	0	0	0	0	0	0	0%
SOLID WASTE	12	13	14	16	17	18	8%
WASTEWATER[5]	58	62	67	72	78	85	8%
ENERGY[6]	7	7	7	7	7	7	0%
TOTALS	129	135	143	154	162	172	6%

[1] Does not include local air program or SHL personnel.

[2] Does not include local law enforcement personnel.

[3] Does not include commercial and private applicators totaling approximately 84,500.

[4] Includes only Department of Health personnel involved in potable water matters on a limited basis.

[5] Does not include SHL personnel nor 4,361 certified operators; this total does include agency personnel in both wastewater and potable water programs.

[6] Energy Policy Council staff limited by statute to 7.5 permanent employees.

EDUCATION

Interest in environmental education programs has grown dramatically in Iowa in recent years. The number and variety of course offerings in institutions of higher education reflects a concern for abating pollution sources and protecting valuable natural resources.

Luther College, Cornell College, Coe College and Briar Cliff College are some of the four-year institutions offering programs in environmental studies, environmental biology and conservation, and environmental sciences. The University of Northern Iowa also has an environmental studies program. Iowa State University has curricula in environmental studies, water resources, and sanitary engineering.

Environmental education offerings at Iowa's two-year institutions are more limited. Iowa Central Community College offers a degree in environmental control technology. New programs at Kirkwood Community College include environmental health technology and water and wastewater technology. It is likely that more programs will be offered in the near future.

LEGISLATION

The environmental/energy legislation for Iowa was obtained by request from various agency personnel and through various library references. Summaries of the legislation deemed most relevant to the eight subject areas of the workforce assessment were prepared, and are included in the respective state reports. The following list of laws represents virtually all environmental legislation for the state. Only certain of the following laws were summarized; the list is presented to show, by title, the kinds of laws which have been enacted.

Environmental Quality Act

Pesticide Act of Iowa

Energy Policy Council Law

Surface Mining Law

National Environmental Energy Workforce Assessment

Phase I

IOWA

State Report

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STATE PROFILE

Iowa, the Hawkeye State, is often referred to as the land between the rivers as the Mississippi River forms its eastern boundary and the Missouri River forms most of its western boundary. Iowa is a north central state whose gently rolling landscape serves as a bridge between the eastern forest and the western grassland prairie.

The history of the state is marked by Indian confrontations, railroad development, and waves of immigration. All of these factors, combined with a glacial history guaranteeing rich soil for the state, led to Iowa's early agricultural expansion and economic stabilization. The Indian influence in the state is still prominent in the names of cities, counties and other geographical features.

The land area of Iowa is 56,290 square miles and the 1970 population was 2,824,000. The population is approximately one-half urban and one-half rural, a fact which may contribute to Iowa's acknowledged status of a middle position -- economically, politically and geographically.

While Iowa has maintained its rural image, fewer farms and greater urbanization are, in fact, the rule. Des Moines is the capital and largest city, and is one of the nation's major insurance centers. Other population centers include Cedar Rapids, Davenport, Sioux City, Council Bluffs, Waterloo and Dubuque. More industry to support the state's agricultural base is the primary factor in the population

shift. Agricultural machinery, electronic products, household appliances and refrigeration equipment are major industries.

Fully 95 percent of the land of Iowa is cultivable -- a larger proportion than any other state. As a result Iowa has moved to the forefront as an agricultural state and ranks second only to California in combined agricultural output. Iowa ranks first nationally in total value of all livestock and poultry; it ranks first in hogs, second in cattle and third in sheep. The state is normally first or second in corn and soybean production, second in oats and fourth in hay.

Transportation in Iowa is geared largely to more than 112,000 miles of roads, one of the most extensive road networks in the world. Iowa has over 8,000 miles of first-class railroad track which ranks it fourth among the states in that category. Barge traffic on the Mississippi and Missouri Rivers is also crucial to the state in the movement of corn, soybeans, and other commodities.

Iowa's major geographic features are a result of the continental ice sheets which covered the state during the Pleistocene Epoch. Deposits of loess have formed bluffs nearly 200 feet nigh along portions of the Missouri River and give Council Bluffs its name. The broad, flat uplands are found in the central and north-central portions of the state and contain some of the world's richest soil. The northeastern section of the state is more rough and forested and shares a less fertile soil with other portions of eastern and southern Iowa. Iowa's popular lakes and resort area is in the northwest near the Minnesota border.

Politically Iowa is often thought of as conservative and Republican; but in recent years Democrats have been winning a larger number of state and federal offices. Iowans have shown a great deal of independence in electing officeholders from both parties with farm prices and agricultural concerns foremost in nearly all elections. It is generally felt that Republican strength lies in small cities and towns and Democratic strongholds are in larger urban areas and farms.

Iowa has not experienced recent population growth, and only limited success at attracting industry to the state has continued the heavy reliance on the agricultural sector. Most environmental concerns will focus on preserving the state's precious land resources and preventing agricultural pollution of waterways; land use legislation appears to be vital to the state's future. Iowa's relative freedom from crowding and environmental pollution common to other areas could eventually be its chief attribute.

IOWA POLLUTION CONTROL AND ABATEMENT AGENCIES

There are a number of agencies, councils and commissions active in Iowa's environmental protection effort. The most important agency in terms of program responsibility is the Department of Environmental Quality (DEQ). Other bodies involved in the environmental/energy fields include the Department of Agriculture, the Department of Health, the Department of Transportation, the University of Iowa State Hygienic Laboratory, the Energy Policy Council and the Natural Resources Council.

The main offices of DEQ, and of most state agencies, are located in Des Moines. DEQ also has six regional offices as shown on the following map. The Department policies and programs are actually developed by four commissions with coordination assured by an Executive Committee. As shown in the following organizational chart, the four commissions are the Air Quality Commission, the Chemical Technology Commission, the Solid Waste Disposal Commission, and the Water Quality Commission.

Plans and policies developed for DEQ are carried out by the Executive Director through four divisions: Air Quality Management Division, Compliance Monitoring Division, Land Quality Management Division, and Water Quality Management Division. An Office of Administration is responsible for matters in that area.

As of December 1976, Iowa DEQ had a staff of 159 full-time employees. This total included 28 in Administration, 13 in Compliance Monitoring, and 36 in Regional Offices. Detailed discussions of staffing for other Divisions is contained in the respective sections of this report.

The Department of Agriculture shares primary responsibility for pesticide programs with DEQ. The Pesticide Section within the Laboratory Division currently has a staff of 18 persons, including laboratory and enforcement personnel.

Iowa's Department of Health has, among its numerous duties, significant responsibility in providing safe drinking water supplies. The Department shares with DEQ the role of assuring potable water supplies adequate in both quantity and quality. Department of Health activities focus on laboratory matters and sample analysis.

Another state agency involved in environmental matters is the Department of Transportation. Specifically the Environmental Coordination Section within the Highway Division undertakes noise assessment and control studies for road construction; this is the only noise program in Iowa.

The University of Iowa's State Hygienic Laboratory (SHL) is a public service organization which provides valuable environmental workforce support, under contract, to several state agencies. SHL has an Environmental Science Services division and a Des Moines Branch Laboratory which provide assistance in a number of program areas. Approximately 12 to 15 persons are involved almost entirely in environmental activities.

The Iowa Energy Policy Council is a thirteen-member body established in 1974 to formulate a state energy policy. Also the Council administers the Federal fuel allocation program. The Iowa Natural Resources Council is a nine-member organization; its duties include the control of water quality and use, flood control planning, and administration of the state oil and gas conservation law.

IOWA DEPARTMENT OF ENVIRONMENTAL QUALITY
Figure 1

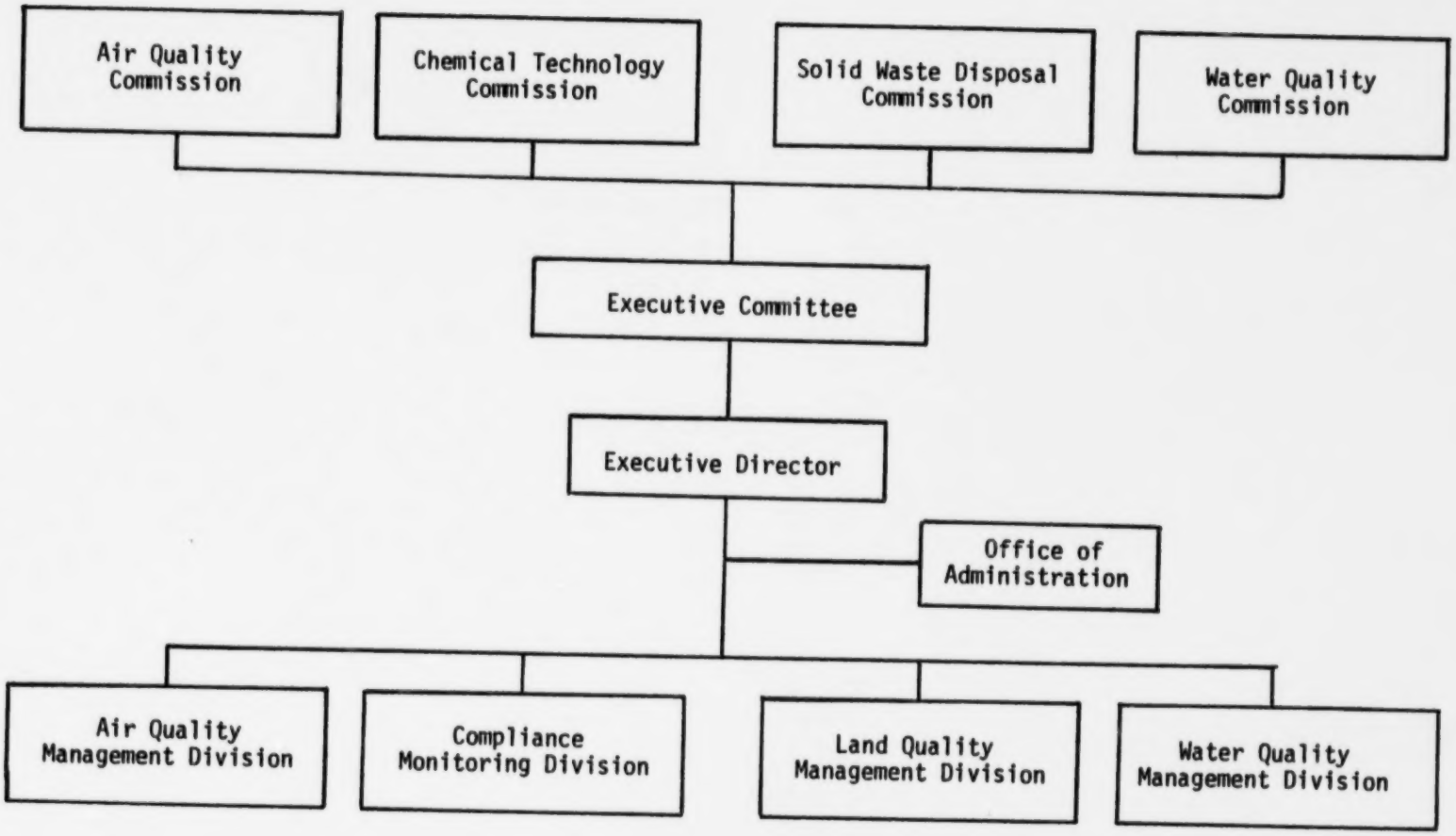


Figure 2: DEPARTMENT OF ENVIRONMENTAL QUALITY REGIONAL OFFICES

Pollution Control and Abatement Programs

I. AIR

A. Introduction

Iowa's air pollution control program was established within the Department of Environmental Quality (DEQ) in January of 1973. Statutory authority for air matters is contained in Division II of the Department of Environmental Quality Act, Chapter 455B of the Code of Iowa.

The Air Quality Commission and the Air Quality Management Division of DEQ have primary responsibility for carrying out actions to attain or maintain ambient air quality in compliance with established standards. Fourteen Commission duties are set forth in the statute, the most significant being to: direct the development of a comprehensive plan for the abatement, control, and prevention of air pollution in this state, recognizing varying requirements for different areas in the state.

The Air Quality Management Division is responsible for carrying out program mandates of the Commission and for day-to-day air monitoring and related activities. The Division is divided into a Permits Section and a Surveillance and Compliance Section. Activities of the Permits Section include air monitoring, plan maintenance, ambient data analysis, emissions inventory, and construction permit issuance. The Surveillance and Compliance Section is active in source inspection, point source compliance, stack sampling, and general enforcement.

The State Hygienic Laboratory (SHL) of the University of Iowa has a major role in air matters and conducts most air monitoring in

the state. SHL maintains 53 air sampling and monitoring devices; the Laboratory also operates a mobile unit capable of a broad range of sampling activities for use in problem areas and emergency situations.

Four other agencies are involved in air monitoring in Iowa. These agencies are the Des Moines - Polk County Health Department (DMPC), the Linn County Health Department (LCHD), the Quad Cities Regional Air Pollution Board (QCAP), and the Environmental Protection Agency's National Air Surveillance Network (EPA). A map showing the air monitoring stations in Iowa follows this section; the following table shows monitoring information according to pollutant, method and responsible agency.

TABLE I

IOWA AIR MONITORING NETWORK

Pollutant	Monitor Type	SHL	DMPC	LCHD	QCAP	EPA
TSP	High-volume	24	11	6	5	5
SO_2	Gas Bubbler	12	5		1	2
SO_2	Continuous	7		2	1	
NO_2	Gas Bubbler	2	5	1		2
Haze	Tape	7	1	2	2	
Ozone	Continuous		2	1		
CO	Continuous	1	1	1		
Hyd'Carbon	Continuous			1		
Oxidant	Continuous				2	
TOTAL		53	25	14	11	9

As shown by the above table, there is a total of 112 air monitoring stations in the state with particulate sampling being the most common. The entire monitoring network is coordinated by DEQ's Air Quality

Management Division. The above figures are for 1975, and 14 additional monitors were to begin operation in 1976.

While Iowa is normally considered to be a rural state, it is beginning to face a number of air pollution problems. Motor vehicle emissions are the largest source of air pollution in the state; the levels of carbon monoxide, hydrocarbons, and nitrogen oxides produced often exceed standards in large metropolitan areas. Visible emission regulations have been enacted and are used to control motor vehicle emissions.

Suspended particulates have been a major source of air pollution in the state. Open burning, large point sources, and fugitive dust are the main sources of these particulates. Attempts have been made to control open burning and to require installation of control equipment at point sources; contingency plans have been developed to deal with critical fugitive dust levels. Objectionable odors from local industries or livestock operations have been cited as an increasing problem. In 1975, an Odor Control Advisory Committee was established to study and make recommendations on this matter.

B. Workforce Profile

Information for the workforce profile and workforce projections sections of the report was obtained by means of on-site and telephone interviews with DEQ personnel and local air program personnel. Some information was also obtained from agency program documents.

The Air Quality Management Division of DEQ has a staff of 20 persons in its two sections of Permits and Surveillance and Compliance. Staffing by occupational category for the Division is shown in the following table.

TABLE II

DEPARTMENT OF ENVIRONMENTAL QUALITY

Air Quality Management Division
Current (1976) Staffing Level

Position	1976
Engineer	4
Environmental Specialist	9
Environmental Technician	1
Administrator	3
Clerical	3
TOTAL	20

Most of the engineers are mechanical engineers, and the environmental specialists are largely physicists and meteorologists. The administrators have training in physics, chemistry and mechanical engineering. The entire staff is located the Des Moines office.

As noted previously, the State Hygienic Laboratory (SHL) performs a large portion of Iowa's air monitoring activity under contract with DEQ. The Laboratory is a public service organization of the University of Iowa in Iowa City. SHL provides a wide range of scientific and laboratory support to DEQ and to other state and local agencies. Air pollution activities are carried out under the Environmental Science

Services branch of SHL. A staff of five persons is involved in air quality monitoring functions: one administrator/chemist, two additional chemists, and two technicians.

As provided for in the Clean Air Act and as shown on the map at the end of this section, Iowa has been divided into 12 Air Quality Control Regions (AQCR); six of these are interstate regions and six are intrastate. The interstate AQCR's are: Burlington - Keokuk, Metropolitan Dubuque, Metropolitan Quad Cities, Metropolitan Omaha - Council Bluffs, Metropolitan Sioux City, and Metropolitan Sioux Falls. DEQ and SHL perform most air monitoring and quality functions in ten of the regions, but local air programs are active in the Des Moines and Cedar Rapids areas.

The Air Pollution Control Section of the Des Moines - Polk County Health Department employs a staff of six full-time persons. The staff is composed of one air pollution engineer/administrator, one air pollution chemist, one environmental specialist, one laboratory technician, and two sanitarians. Functions of the Section include air quality monitoring, sample analysis, permit issuance, and plant inspections. The Section also works closely with DEQ on data collection and use of equipment.

Iowa's only other local air program is carried out by the Air Pollution Control Division of the Linn County Health Department. The full-time staff is composed of two air pollution control officers; other Department support results in a total of 4.8 person-years being

devoted to air quality activity. The air pollution control officers are trained in chemistry and biology. Laboratory support of one supervisor and two technicians provides the bulk of additional air personnel in monitoring, sample analysis and enforcement activities.

No workforce figures for the private sector are available; however, it was pointed out that 754 sources were monitored for air emissions in 1976, and normally utilizing a person on the maintenance crew for air pollution control. During 1975, 280 construction permits for air pollution control equipment were issued.

C. Workforce Projections

Future workforce needs and projections are based on best professional judgments of people active in the air quality field. Workforce needs normally depend on funding levels, legislative mandates and other contingencies.

The initial organizational and implementation work for Iowa's air program has been accomplished during the past four years. As a result, little if any staff growth for the Air Quality Management Division is projected. It is felt that a very stable program exists at present and, with continued monitoring assistance from agencies noted above, no expansion is projected.

TABLE III

DEPARTMENT OF ENVIRONMENTAL QUALITY

Air Quality Management Division
Workforce Projections to 1982 (est.)

Position	1976	1977	1978	1979	1980	1981	%/annum turnover (average)	%/annum growth (average)
Engineer	4	4	4	5	5	6	n/a	9%
Environmental Specialist	9	9	9	10	10	11	n/a	4%
Environmental Technician	1	1	1	1	1	1	n/a	0%
Administrator	3	3	3	3	3	3	n/a	0%
Clerical	3	3	3	3	3	3	n/a	0%
TOTAL	20	20	20	22	22	24	16%	4%

The 16 percent annual turnover rate is for all of DEQ. Approximately three-fourths of the turnover is in professional/technical positions. At the DEQ Division level, it appears that most hiring that is done will be to replace turnover. Fugitive dust and odor problems may receive more attention in the future.

Neither the Polk County nor Linn County air programs anticipate much workforce growth over the next five years because of budget limitations. Air quality monitoring and other activities continue to increase for both agencies; but unless more federal funds become available, it is unlikely that any hiring will be done for either program. Both agencies expressed a need for at least one additional environmental specialist or air pollution control officer immediately, but there was little optimism that this need would be filled.

D. Training and Certification

Iowa DEQ has developed and implemented an extensive in-house training program, and one full-time person is responsible for coordinating staff training activities. Each employee is allowed one week of training per year and in many cases two weeks of training are received. Generally, the annual training includes one management course, one technical course, and a conference. In addition, some on-the-job training is utilized for more technical positions and extra formal courses are provided for new entrants.

The Division conducts a smoke reading school every six months for its own employees and for other state and local enforcement personnel. The school lasts one or two days with an average attendance of from 25 to 50 persons at each offering. A series of tests is administered in conjunction with the school for recertification purposes.

Annual reports and plans contribute to the educational effort. DEQ personnel conduct seminars for public officials to inform them of laws, regulations and other requirements.

E. Career Potential

Projections for workforce growth of four percent per year or less combined with a relatively low turnover rate mean that career potential in Iowa's air pollution control program will be extremely limited. Based on past turnover, positions will be primarily at the degreed or technical levels. Pollution control and monitoring equipment is becoming more prevalent and more complex although no predictions were made on career potential in this area.

If funding becomes available, a limited number of career opportunities may exist for local air programs. These would be in the environmental specialist or technician categories to deal with air monitoring and enforcement activities.

Some programs were cited which may result in more activity and potentially more jobs. Greater concern for obnoxious odors and suspended particulates, especially fugitive dust and control of open burning, were noted. What effect regulations in these and other program areas might have on DEQ and enforcement personnel would be extremely speculative at this point.

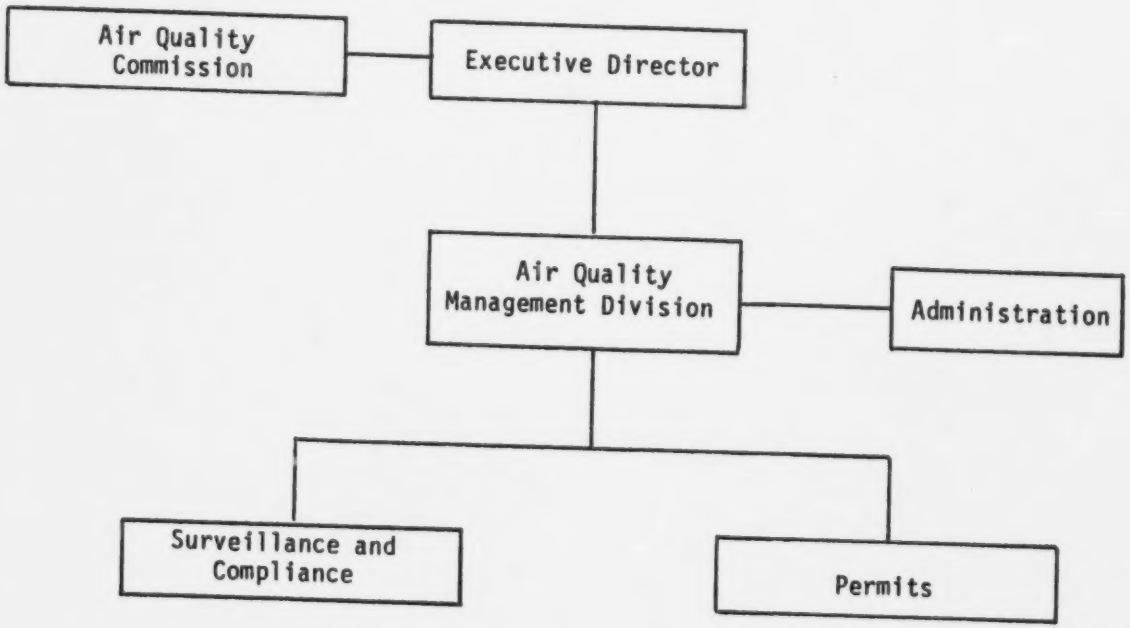
F. Conclusion

Iowa has been expanding and improving its air pollution control activities in recent years, largely through the Department of Environmental Quality and the State Hygienic Laboratory. Most staff positions are filled by engineers, environmental specialists, chemists, and other skilled professions.

Very little workforce growth and career opportunities are expected over the next five years; DEQ expects only a four percent annual growth rate in the air division. More expansion may occur if federal funds become available or if a decision is made to commit more resources to such problems as motor vehicle emissions, fugitive dust, or odor control. The DEQ training and education programs are viewed as very important and are expected to continue.

IOWA DEPARTMENT OF ENVIRONMENTAL QUALITY

Air Program
Figure 3



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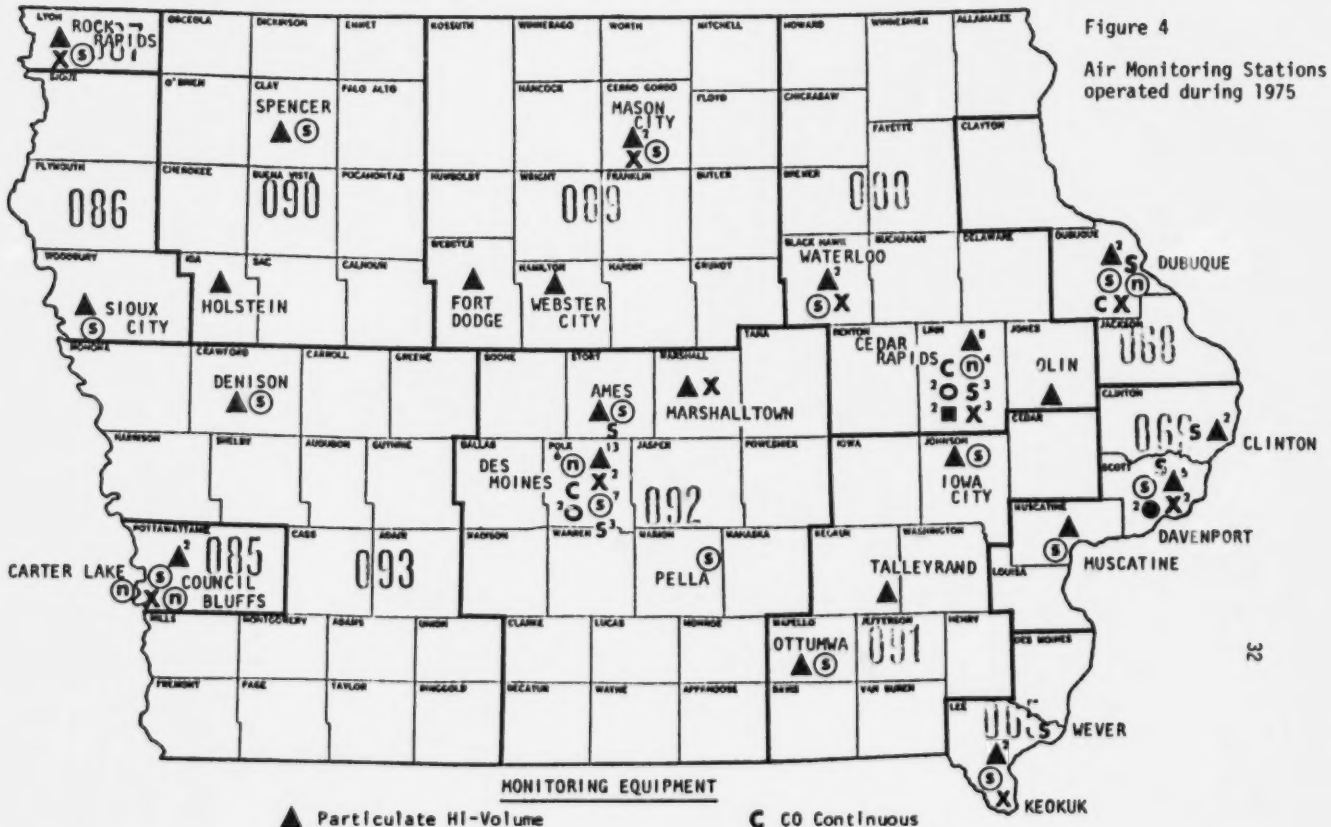


Figure 4

Air Monitoring Stations operated during 1975

The number nearest symbol indicates multiple monitors of that type.

II. NOISE

A. Introduction

There is currently no active statewide noise program in Iowa. A comprehensive noise control law has been introduced in the Legislature a number of times but has not yet been enacted. A number of municipal noise ordinances have been passed in attempts to control noise emissions at the local level.

The Department of Environmental Quality (DEQ) would be the state lead agency for any noise control standards, but noise pollution is a low priority and no activity in this area is anticipated. The Iowa Department of Transportation (DOT) administers a limited noise program. associated with the Federal-Aid Highway Act of 1970. Regulations issued pursuant to the Act call for the assessment of highway noise impacts relative to ambient noise levels and design noise levels. Present and predicted noise levels are analyzed, often in conjunction with environmental impact statements. When established standards are exceeded, noise abatement techniques such as road re-location, noise barriers, or truck re-routing may be required.

B. Workforce Profile

Because of the lack of a statewide noise control effort, very few people are employed in this field. The Environmental Coordination Section of the DOT Highway Division has a staff of seven persons, four of whom are responsible for noise studies and assessments. While none

of the four staff members has had college-level noise training, they have all had extensive experience and have attended several seminars in the field. The Section head is a landscape architect, and the other noise personnel include two biology majors and one history major.

Nine cities in Iowa have enacted some form of noise control ordinance. The types and coverage of these ordinances is shown in the following table adapted from Sound and Vibration, December, 1975.

TABLE IV

STATE OF IOWA

Municipal Noise Ordinances
(1975)

Community	Nuisance	Zoning	Vehicle	Rec./Vehicle	Railroad	Aircraft	Construction	Building
Cedar Falls	0	X	X	-	-	-	0	-
Council Bluffs	0	-	0	0	-	-	0	-
Davenport	0	-	0	-	-	-	0	-
Des Moines	0	-	0	-	-	-	0	-
Dubuque	0	X	X	-	-	-	-	-
Pella	-	-	X	-	-	-	-	-
Sioux City	0	0	0	-	-	-	-	-
Storm Lake	0	X	X	-	-	-	-	-
Waterloo	0	-	-	-	-	-	-	-

Key: X = Regulations include accoustical criteria
0 = Regulations do not include acoustical criteria
- = No regulations

C. Workforce Projections

No growth in Iowa's public sector noise program is anticipated over the next five years. DEQ intends to devote its efforts to other program priorities; this posture is only likely to change in the event that the Legislature enacts a comprehensive noise control law. Environmental noise pollution is a field that is still in its infancy, and as professional areas become more defined some growth may evolve.

DOT Environmental Coordination Section personnel do not expect any growth in the noise study and control field. New highway construction is being de-emphasized and more attention is being given to reconstruction of existing roads. As a result, noise studies will be fewer in number and less elaborate.

D. Training and Certification

At present no training or certification is conducted in the noise field. The use of noise monitoring equipment at the local level may eventually result in the development of some equipment-use training. DOT personnel regularly attended noise-related conferences, usually conducted by the National Highway Institute.

E. Career Potential

The lack of a statewide noise program in Iowa and the probability of no workforce expansion at DOT virtually precludes the existence of career opportunities in this field. It is possible that new state

legislation would create some positions for persons with training in engineering, physics, and acoustics.

F. Conclusion

DEQ does not plan to develop a noise control program in the near future, and DOT's highway noise control effort is limited to four persons. A state noise law and public awareness of noise as a real environmental problem are the two factors which could change the limited workforce and operational prospects for noise in Iowa.

III. PESTICIDES

A. Introduction

Iowa has long been recognized as a leading agricultural state. Its preeminence in this field continues to the present time with more intensive land use and farming methods requiring greater reliance on agricultural chemicals. The need to control the use and effects of these chemicals is also becoming more important.

The Pesticide Act of Iowa, Chapter 206 of the Code, is the primary pesticide legislation for the state. The law provides for pesticide registration and control; it has recently been amended to provide for the control of pesticide applicator certification as required under federal law. Aerial pesticide applicators are separately regulated, and other pesticide control provisions are contained in the Department of Environmental Quality Act.

Responsibility for pesticide program activities rests jointly with the Iowa Department of Agriculture (DOA) and the Department of Environmental Quality (DEQ). Specifically the Pesticide Section of the Laboratory Division within DOA has as its main goal the assurance of proper pesticide use. The duties of the Pesticide Section, as set forth in the Iowa Administrative Code, are:

- registers pesticide products,
- licenses and certifies pesticide applicators,
- monitors consumer products for pesticide residues,
- cooperates with DEQ and other agencies.

There are pesticide residue and pesticide formulation laboratories located within the Division in Des Moines.

The Chemical Technology Commission of DEQ has recently assumed some pesticide responsibilities in cooperation with the Department of Agriculture. Major duties of the Commission include:

- coordinate state agency responsibilities on sale and use of agricultural chemicals,
- designate pests,
- control pesticide container storage, transportation and disposal,
- determine proper pesticide uses and formulations,
- require the reporting by veterinarians of all cases of domestic livestock poisoning.

Pesticide container disposal programs have recently been a high priority. The Land Quality Management Division of DEQ is generally responsible for carrying out Commission policies.

B. Workforce Profile

Information on current and projected workforce levels is a result of on-site and telephone interviews with personnel in the respective state agencies.

The Pesticide Section currently has a staff of 18 persons, including enforcement and laboratory employees. The following table depicts Section staffing according to occupational category.

TABLE V

DEPARTMENT OF AGRICULTURE

Pesticide Section
Current (1976) Staffing Level

Position	1976
Investigator	4
Chemist	4
Technician	2
Administrator	2
Clerical	5
Other	1
TOTAL	18

The "Other" category consists of a laboratory aide. The Clerical category is composed of four full-time and two part-time secretaries. The investigators preferably have a farming background with a degree in agricultural or chemical fields. The laboratory technicians have generally completed two to four years of college in chemistry or microbiology.

In addition, a pool of 20 agricultural product inspectors for the Division is available to the pesticides unit, and performs a variety of functions. The inspectors work on-call for pesticide incidents and accidents and perform duties in the areas of fertilizer, feed, medicated feed, and seed.

The Chemical Technology Commission is composed of nine members who function in a rule-making and policy-formulating role on pesticide matters. Two environmental specialists within DEQ's Land Quality Management Division have been active in the applicator certification plan and other pesticide matters on behalf of the Commission.

The Entomology Department of Iowa State University has responsibility for training all commercial applicators in the state. In addition the Department must supervise the training of private applicators which is to be done through 12 Area Crop Specialists and 100 County Extension Directors. Three of the Department's extension entomologists are currently the only persons working full-time on commercial applicator training and private training coordination.

Laboratory Division personnel of DOA estimate that there are approximately 3,500 commercial businesses in the state applying pesticides; the State Plan for applicators estimates that 7,000 commercial applicators

may seek certification. Approximately 12,500 farmers were trained and certified as private applicators during 1976. Current estimates are that as many as 65,000 more farmers will need to be trained and certified in restricted-use pesticide application. The following table shows anticipated private sector pesticide staffing levels in 1977.

TABLE VI

STATE OF IOWA

Private Sector Pesticides Personnel
Projected (1977) Staffing Levels (est.)

Category		1977
COMMERCIAL APPLICATOR		7,000
Agricultural Weed Control	2,600	
Agricultural Insect Control	1,500	
Agricultural Fungus Control	800	
Animal Pest Control	300	
Forest Pest Control	10	
Fruit - Vegetable Pest Control	100	
Shade Tree, Ornamental & Turf Pest Control	200	
Seed Treatment	10	
Aquatic Pest Control	30	
Right-of-Way Pest Control	400	
General and Household Pest Control	200	
Termite Control	200	
Food Industry Pest Control	100	
Public Health Pest Control	200	
Community Insect Control	50	
Regulatory Pest Control	50	
Demonstration and Research Pest Control	50	
Aerial Applicator	200	
PRIVATE APPLICATOR		77,500
TOTAL		84,500

The above table makes evident the impact of the 1972 amendments to the Federal Insecticide, Fungicide and Rodenticide Act as they relate to private sector pesticide applicators. It is anticipated that the bulk of the private sector personnel will be certified by October 1977.

C. Workforce Projections

Figures for workforce projections represent best professional judgements of persons working in the pesticides control area. Numerous contingencies and unforeseen events can drastically affect these estimates.

Potential staff growth over the next five years for Department of Agriculture pesticides personnel is shown in the following table.

TABLE VII

DEPARTMENT OF AGRICULTURE

Pesticide Section
Workforce Projections to 1982 (est.)

Position	1976	1977	1978	1979	1980	1981	%/annum turnover (average)	%/annum growth (average)
Investigator	4	5	6	7	8	8	n/a	15%
Chemist	4	4	5	5	5	5	n/a	5%
Technician	2	2	2	3	3	3	n/a	10%
Administrator	2	2	2	2	2	2	n/a	0
Clerical	5	5	5	5	5	5	n/a	0
Other	1	1	1	1	1	1	n/a	0
TOTAL	18	19	21	23	24	24	5%	6%

The number of investigators is expected to double because of increasing enforcement demands of state and federal laws. The chemist and technician will be added in the formulation lab to assist with the growing workload in that area. Not shown in the above table is sizeable potential staff increase for state enforcement of the Toxic Substances Control Act. A new laboratory computer may also alter workforce needs and occupational categories for that field.

The turnover rate noted above is based on one person having left in 1976 and the expectation that two more people will leave in 1977. Little difficulty has been encountered in filling most vacancies.

Some growth may occur in the category of private sector pesticide applicators. The number of private applicators (farmers) certified by the spring of 1978 may be as high as 100,000. This number is expected to remain constant or show a slight decrease over the next five to ten years because of larger farms, fewer farmers, and more complex chemicals and equipment. Among commercial applicators, limited but undetermined growth is expected, particularly in the categories of agricultural pest control and industrial, institutional and structural pest control. This anticipated growth offsets some of the expected decline in the number of certified farmers; it can be attributed to the greater degree of sophistication of pesticides and application equipment.

D. Training and Certification

The Iowa State University Cooperative Extension Service and the University's Entomology Department are responsible for training commercial and private applicators in Iowa. Testing and certification will be conducted by the Department of Agriculture. Three extension entomologists have the assigned function of preparing and presenting commercial applicator training, coordinating matters with DOA, and assisting with development of regulations.

Training of private applicators is the result of a joint effort between Area Crop Specialists and County Extension Directors. All of the Extension field personnel have received instruction from the University on restricted-use pesticide matters. Previously farmers were required to take a test to be certified; the Iowa law has now been amended to simply require attendance at training sessions to receive

certification. To compensate for not testing private applicators, the training materials have been upgraded and made more extensive.

Commercial applicator training is conducted according to categories with most courses being offered in each of the 12 extension areas. Training for small categories may be offered only once at a central location. It is estimated that 80% of all commercial applicators will be certified in the areas of agricultural weed control and agricultural insect control. Another feature of the Iowa law requires that all commercial applicators be trained and certified, even if they only apply general-use pesticides.

An effort is made at providing initial informal training for all new DOA employees. Two-day update conferences are provided in-house twice per year, and other upgrade training is available from regional EPA personnel. Extension Service training from Iowa State University is also used by employees on occasion. DOA personnel feel that more formal, college-level education is needed for pesticide investigators and inspectors. It was pointed out that several different agencies must rely on the limited workforce pool in these matters.

E. Career Potential

A moderate amount of public sector workforce growth and a potential increase in the number of commercial applicators indicate a relatively good career outlook in the pesticides area. It was noted that a number of state and federal agencies compete for persons with agricultural/pesticides training; while these positions have not been difficult to fill, it would be advantageous to have more qualified personnel available.

Some growth in the number of commercial applicators is expected due to the complexity of chemicals and equipment. Experience and training in agronomy, chemistry and related fields will be most useful in these careers.

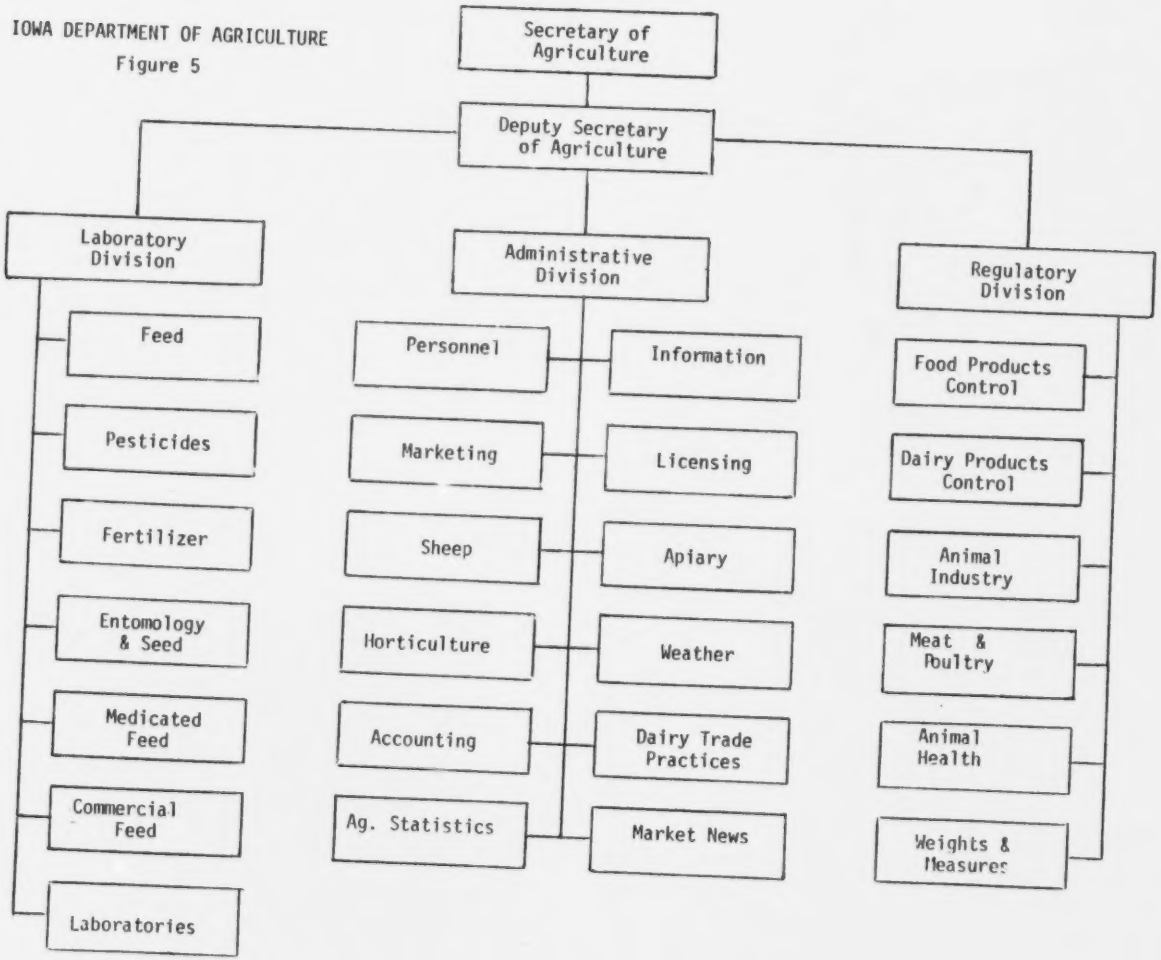
F. Conclusion

Only moderate career growth of approximately six percent per year is expected in public sector pesticides employment. The development and implementation of an applicator training and certification program has been a major recent activity in the state.

Disposal of pesticide containers and investigation of pesticide accidents are two projects recently undertaken by both the Department of Agriculture and the Chemical Technology Commission. Faced with these and other problems, the pesticides field appears to be one demanding more technical skills both in research and use. No significant activity with regard to integrated pest management is expected in the near future.

IOWA DEPARTMENT OF AGRICULTURE

Figure 5



IV. POTABLE WATER

Primary responsibility for Iowa's potable water supply rests with the Water Quality Management Division of the Department of Environmental Quality (DEQ). The Health Engineering Division of the Department of Health has a very limited role in water supply matters.

DEQ's Water Quality Management Division has state responsibility for wastewater and water supplies. The Division has a staff of 58 persons whose functions are not always clearly separable into wastewater and water supply areas. For this reason, the entire Division staffing role and configuration is dealt with in Section VII of this report on Wastewater.

The Department of Health is primarily concerned with sampling and evaluations of private water supplies. Because the definition of public water supplies has been broadened by the Safe Drinking Water Act, the number of private water supplies has been decreased. It appears likely, however, that Department of Health will work with DEQ to continue its monitoring effort of many of these sources.

Presently a staff of 10 professionals work in the Health Engineering Division of the Department of Health. The job title of these persons is area sanitarian and only a small percentage of each one's time is devoted to private water supply work. As the Division assists DEQ in monitoring some small public supplies, guidelines developed by DEQ will need to be followed.

It should be noted that the Iowa Department of Environmental Quality Act, Chapter 455B of the Code of Iowa, was substantially amended in 1976 to spell out new state mandates under the Safe Drinking Water Act. The new legislation and its impact is dealt with in the Wastewater section of this report.

V. RADIATION

A. Introduction

Radiation control activities in Iowa are currently quite minimal. The Department of Environmental Quality (DEQ) is given lead agency responsibility for radioactive material control in the legislation creating the Department. Recent legislation has created the Inter-agency Coordinating Council on Radiation Safety.

Most DEQ radiation activities are conducted by the Solid Waste Disposal Commission through the Land Quality Management Division. Responsibilities of DEQ include:

1) establishment of state policy for transportation, storage, handling, and disposal of radioactive material;

2) issuance of rules for the safe transportation, storage and handling of radioactive material;

3) licensing of persons transporting, handling or storing radioactive material;

4) to approve plans and specifications for nuclear waste disposal sites.

The DEQ FY 1975 Consolidated Environmental Program Plan contained the following statement with regard to the Solid Waste Disposal Commission's radiation effort:

> A state radiation program will be developed which will include transportation and handling of nuclear materials, nuclear waste disposal and control of the use of X-ray machines (Iowa is the only state with no such controls). Coordination of the emergency plan for nuclear incidents will continue.

While DEQ maintains state lead agency responsibility in environmental matters, its posture appears to be one of reduced involvement as noted in the following excerpt from the FY 1977 Consolidated Environmental Program Plan.

> DEQ's role in radiation will diminish as other state agencies become more active in areas which they have responsibilities and expertise. For instance, the Department of Transportation will assume responsibility for transportation.
>
> DEQ's concerns are with disposal, emergency responses and environmental monitoring. By disposal, DEQ is concerned with the disposal of low grade radioactive wastes not regulated by the Federal government. Land Quality will continue to work closely with emergency response teams so that if a mishap does occur a quick and effective response takes place.
>
> Our efforts on radiation monitoring will consist of keeping current on major new developments.

The major radiation-related occurrence between preparation of the two plans was passage of an Act creating an Interagency Coordinating Council on Radiation Safety in 1976. The Council is composed of the chief executive or designee of the following state agencies:

- Department of Environmental Quality;
- Department of Health;
- Department of Transportation;
- Department of Agriculture;
- Department of Public Defense;
- Department of Public Safety;
- State Conservation Commission;
- Bureau of Labor; and
- Iowa representative to Midwest Nuclear Compact (ex-officio, nonvoting member).

Iowa is not a Nuclear Regulatory Commission (NRC) agreement state. Because of this, the NRC will continue with certain of its activities in the state according to federal guidelines.

The state has only one nuclear power facility in operation at the present time; this is the 535-megawatt Duane Arnold Energy Center located at Palo and operated by the Iowa Electric Light and Power Co. In addition, there are four nuclear power facilities operating near Iowa borders -- two in Illinois on the Mississippi River and two in Nebraska on the Missouri River. The Iowa Commerce Commission is partially responsible for control of the Palo power facility.

B. Workforce Profile

As is evident from the introductory section, Iowa's radiation workforce is small and responsibility is widely dispersed. According to the current DEQ Plan, agencies on the Interagency Coordinating Council will be assuming various radiation program responsibilities and DEQ will be active in response and coordination matters.

The DEQ Land Quality Management Division is allocating only five person-weeks to radiation matters in the current fiscal year. Most of this time will be devoted to a questionnaire-survey to assess the extent of possible unsafe disposal of radioactive waste in Iowa.

The Interagency Coordinating Council on Radiation Safety has been in existence for less than one year and a full delineation of agency responsibilities has not yet been made. Information on various workforce needs has not yet been determined for all agencies.

C. Workforce Projections

Because of the status of radiation program responsibilities in Iowa, workforce projections are virtually impossible to make at this time. As noted, Iowa does not have an X-ray use control law at the present time, but it is likely that one will be enacted in the near future. If this occurs, a number of radiologic technologists and radiation safety officers may be required.

D. Training and Certification

Iowa's limited radiation workforce precludes the need for training and certification for people already on-staff. It is possible that technician certification will be required at some future date. Physics, radiology and other courses are available from the state's major institutions of higher education.

E. Career Potential

The present limited workforce in radiation programs and the inability to make meaningful workforce projections hamper the determination of what, if any, career opportunities will exist. As noted previously, Iowa is moving toward the control of X-ray users; this could lead to the development of careers for radiologic technologists, radiation safety officers, and other highly-skilled persons in the radiation and physics fields.

F. Conclusion

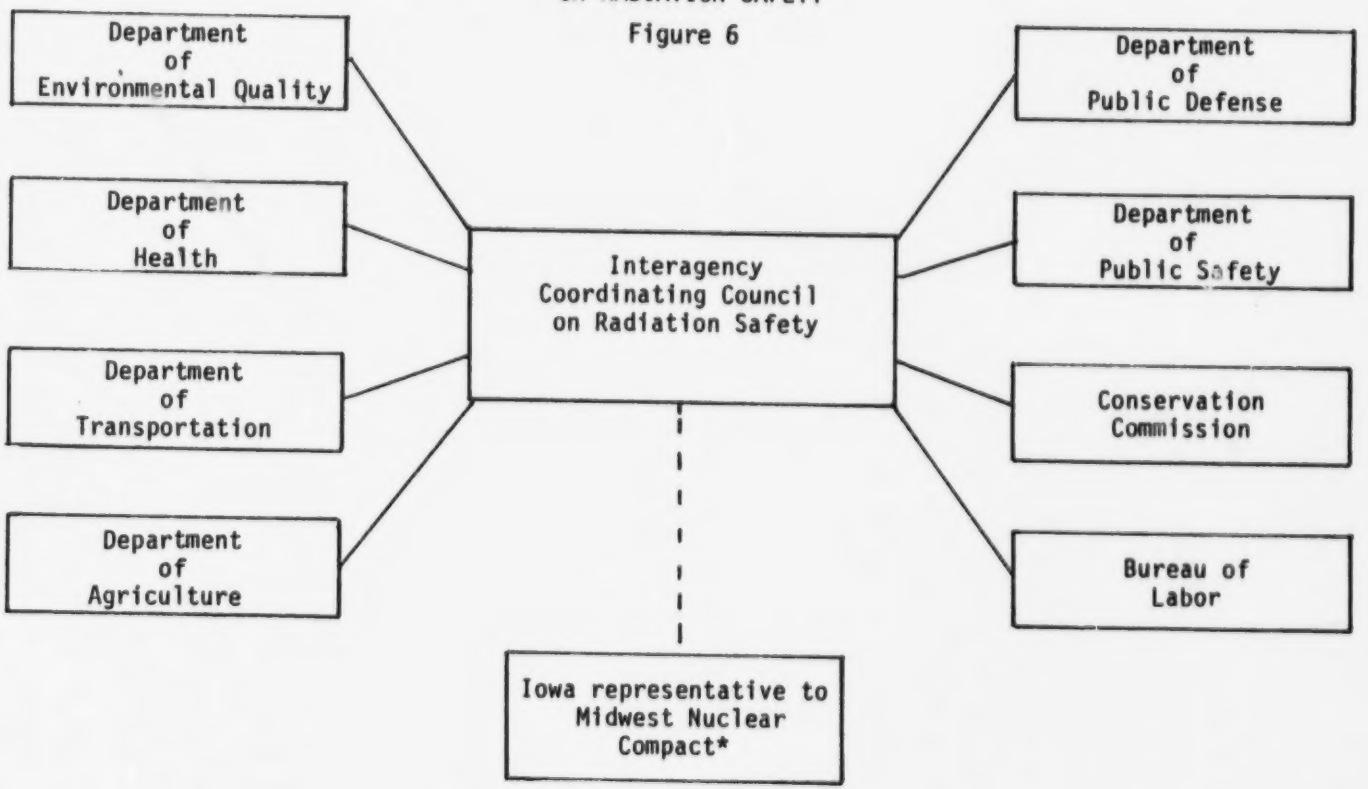
Iowa's present radiation programs and workforce are quite limited, although ever-expanding uses of radioactive materials and devices point out the need for more activity in this area. The creation of the Interagency Coordinating Council on Radiation Safety is a much-needed step in this effort.

The DEQ Land Quality Management Division has primary authority in radiation matters but has only one person involved part-time in the area. As responsibilities become more clearly defined, X-ray use legislation is passed, and more regulations are developed, it seems likely that workforce and careers in radiation will grow.

INTERAGENCY COORDINATING COUNCIL

ON RADIATION SAFETY

Figure 6



*Ex-officio, nonvoting

VI. SOLID WASTE

A. Introduction

Solid waste management and land pollution control programs in Iowa fall within the purview of the Department of Environmental Quality. The Solid Waste Disposal Commission and the Land Quality Management Division of DEQ have primary responsibility for developing programs and carrying out activities in this area. The Division is composed of a Surveillance and Compliance Section and a Permits Section.

Statutory duties of the Commission include: certification of disposal projects of cities, counties and private agencies; enforcement of disposal rules and regulations; and establishment of general litter control programs. In addition, the Commission has handling and disposal responsibilities with regard to certain radioactive materials which are set forth in the radiation section of this report.

A major function of the Land Quality Management Division during 1975 and 1976 has been to supervise the closing of approximately 450 open dumps in the state. Connected with this has been the approval of sites for sanitary landfills and ensuring their proper operation. Over 92% of the Iowa population is now served by a state-approved sanitary landfill.

With the permit program and local operations in place, it is expected that the Division will shift its emphasis to solid waste matters from the point of generation to final disposal. Tighter control on hazardous wastes, safer transportation and storage, and greater reliance on resource recovery are all areas of future concern.

In order to preserve valuable agricultural land, resource recovery and recycling of wastes will receive greater stress as alternatives to sanitary landfills. Recycling programs for hazardous wastes, metal pesticide containers, waste engine oil, and industrial by-products have already been investigated or implemented. The Division is also studying the land application of sludges to solve a disposal problem in this area.

All cities and counties are responsible for storage, collection and transportation of solid wastes for areas within their jurisdiction. The public agency can provide for a private agency to perform this function. Permits are issued by DEQ for sanitary landfills and changes in solid waste management practices must be approved by the state agency.

B. Workforce Profile

Information regarding the current and projected workforce profiles was obtained through on-site and telephone interviews with solid waste management and land quality personnel. The current staffing level of the DEQ Land Quality Management Division is 12 persons. The following table depicts the Division workforce level by occupational category.

TABLE VIII

DEPARTMENT OF ENVIRONMENTAL QUALITY

Land Quality Management Division
Current (1976) Staffing Level

Position	1976
Engineer	3
Environmental Specialist	4
Administrator	3
Clerical	2
TOTAL	12

Among the administrators are two engineers and one sociologist who is the Division director. The engineer category includes industrial and civil engineers; the specialist category includes two chemists.

Turnover within the Division is estimated at 16% per year, the same as for the Department as a whole. Except for chemists, most vacancies are relatively easy to fill. There are currently some vacancies in the specialist category for chemists.

No workforce information is available for local personnel involved in sanitary landfill operations. There are 90 operating landfills in Iowa, each of which has at least one operator. There is no mandatory certification program for landfill operators although training for operators has been available in the past. Turnover in this area is felt to be extremely low because of an attractive pay scale.

C. Workforce Projections

The following workforce projection information represents best professional judgments of persons employed in the field. Financial and legislative contingencies may have a significant impact on these figures.

Little information was available for growth in the Land Quality Management Division or for specific job categories. The following table is based on the assumption that an approximate eight percent per year staffing increase for DEQ will represent similar expansion in the Division; it is also assumed that growth will occur in all occupations.

TABLE IX

DEPARTMENT OF ENVIRONMENTAL QUALITY

Land Quality Management Division
Workforce Projections to 1982 (est.)

Position	1976	1977	1978	1979	1980	1981	%/annum turnover (average)	%/annum growth (average)
Engineer	3	4	4	4	5	5	n/a	11%
Environmental Specialist	4	4	5	6	6	7	n/a	12%
Administrator	3	3	3	4	4	4	n/a	6%
Clerical	2	2	2	2	2	2	n/a	0%
TOTAL	12	13	14	16	17	18	16%	8%

The 16% turnover rate is for DEQ as a whole and is projected to be reasonably accurate for each Division.

The modest increases projected are based on normal growth for the present activities and requirements. It is felt that more significant growth may occur in the Land Quality Management Division as a result of the Resource Conservation and Recovery Act of 1976 (RCRA). More state planning and more recycling programs will be required under RCRA but it is too early to determine specific workforce needs. Increased activity in hazardous waste matters may also increase staffing needs beyond the levels shown in the above table.

D. Training and Certification

The Land Quality Management Division, like other branches of DEQ, participates in an extensive in-house training program. Each employee is allowed one week of training per year and in many cases two weeks of training are received. Generally the annual training includes one management course, one technical course, and a conference. New entrants also rely on on-the-job training and other formal courses.

In the past, seminars have been conducted throughout the state to acquaint industries with solid waste management requirements and with toxic and hazardous waste disposal problems. Over 300 people attended this training. A Resource Recovery Information Service has been established to collect available information on recycling and resource recovery and to provide technical assistance in these areas.

Training for landfill operators formerly was held six or seven times per year throughout Iowa at colleges and landfill sites; classes

were held twice per week. Approximately 160 operators were trained at these sessions which have temporarily been discontinued because of lack of demand. Iowa does not require certification of landfill operators, so it is impossible to determine what portion of the total is represented by the trained operators.

E. Career Potential

Moderate public sector growth, estimated at eight percent annually for the Land Quality Management Division, should result in career opportunities for qualified persons. In addition the Resource Conservation and Recovery Act, the Toxic Substances Control Act, and the concern with hazardous materials may lead to dramatic, unforeseen workforce needs in the solid waste field. Planners, engineers, and skilled persons in resource recovery and recycling will be most in demand.

Little career potential is seen at the local level. Turnover among sanitary landfill operators is extremely low and most facilities appear to be adequately staffed at the present time. If a program of mandatory certification for operators is instituted, this picture may change to a limited extent.

F. Conclusion

Solid waste activities in Iowa are beginning to shift from landfill certification and enforcement to all phases of solid waste generation,

control and recovery. The DEQ Division staff is comprised mainly of engineers and environmental specialists. Career prospects appear to be best for these professions and for planners as the RCRA is implemented and greater stress is placed on hazardous waste control.

Extensive educational efforts have been undertaken for Division staff and for the general public. A number of sanitary landfill operators have been trained by DEQ although certification is not mandatory and the training is not currently being offered.

IOWA DEPARTMENT OF ENVIRONMENTAL QUALITY

Solid Waste Program

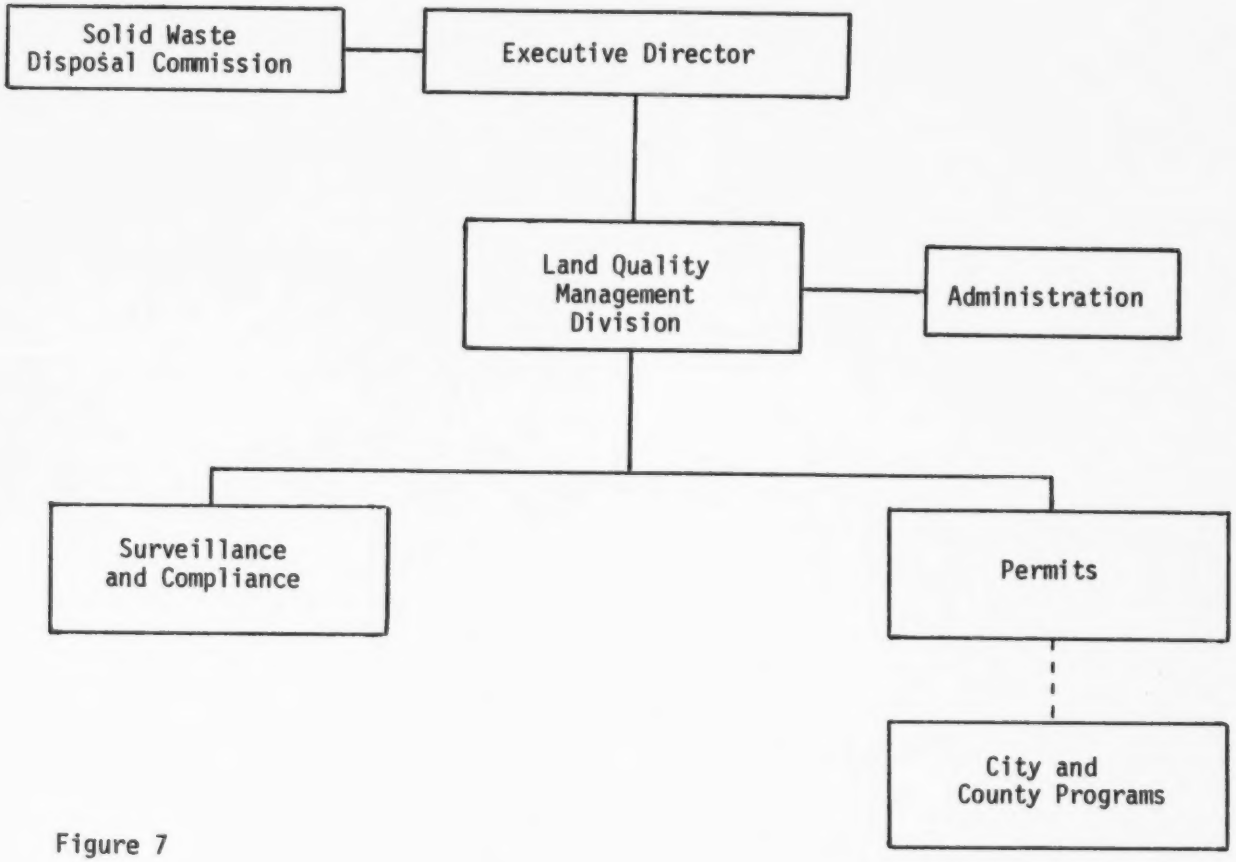
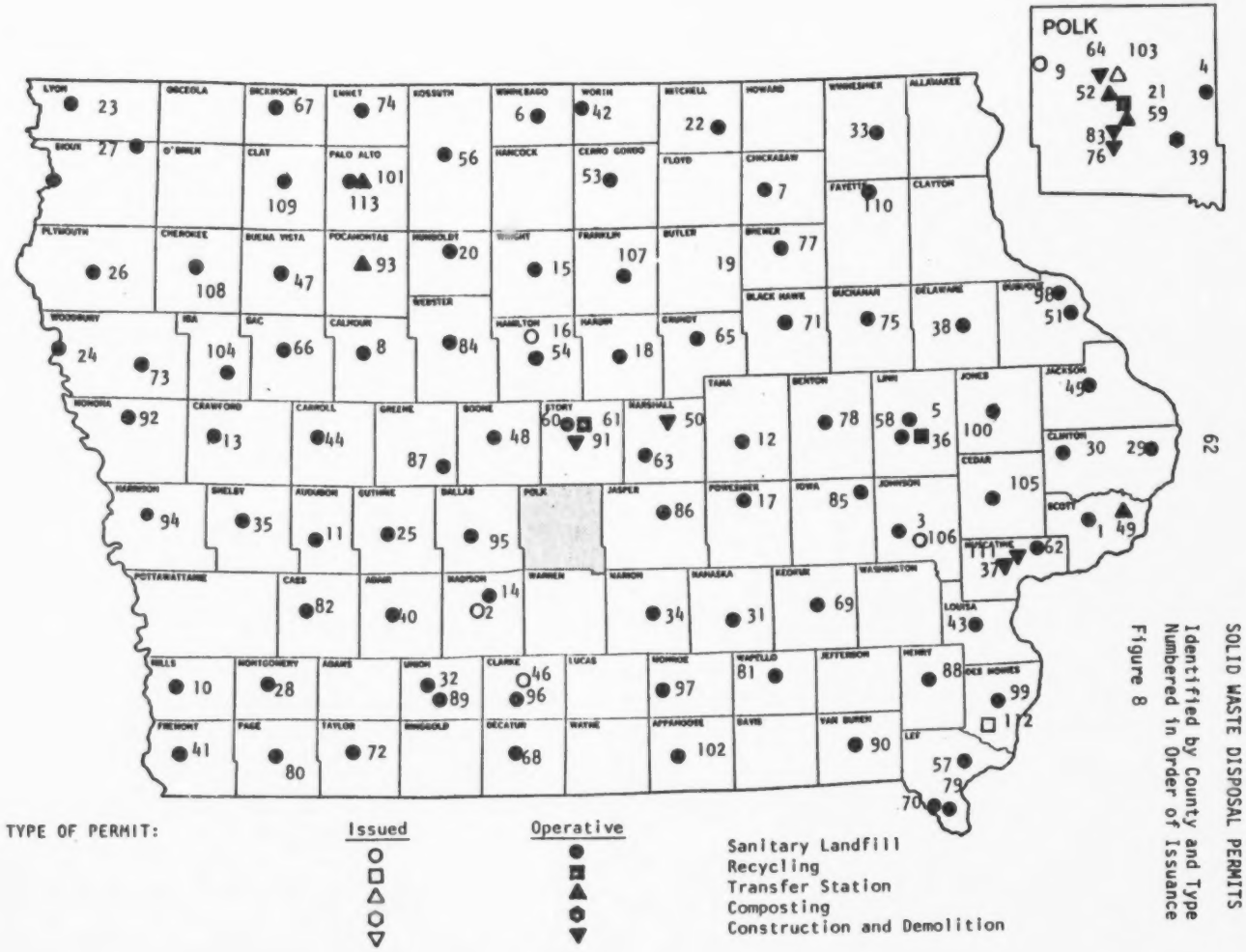


Figure 7



TYPE OF PERMIT:

Issued	Operative	
○	●	Sanitary Landfill
□	■	Recycling
△	▲	Transfer Station
◇	◆	Composting
▽	▼	Construction and Demolition

SOLID WASTE DISPOSAL PERMITS

Identified by County and Type
Numbered in Order of Issuance

Figure 8

VII. WASTEWATER

A. Introduction

The need to control water quality and water supplies is as crucial to Iowa as it is to many other states. While the state's uses of water are fairly typical, a special problem exists for water quality and water pollution control. It is estimated that over half of Iowa's water pollution comes from non-point sources, and in some areas over 95 percent comes from non-point sources. Much of this pollution is associated with agricultural sources.

Statutory authority for water matters is contained in Division III of the Department of Environmental Quality Act, Chapter 455B of the Code of Iowa. The law was substantially amended in 1976 to establish provisions for the state's role under the Safe Drinking Water Act of 1974. Because the Department of Environmental Quality (DEQ) workforce is not separated into strict potable water and wastewater roles, a discussion of the total water quality staff is included in this section of the report.

The Water Quality Commission and the Water Quality Management Division of DEQ are responsible for water quality and water supply programs throughout the state. Duties of the Water Quality Commission include:

1) development of comprehensive plans for water pollution prevention, abatement, and control;

2) establishment of water quality standards, pretreatment standards, and effluent standards;

3) promulgation of rules relating to disposal systems and public water supply systems;

4) establishment of drinking water standards for public water supplies; and

5) cooperation with other state or interstate agencies to control water pollution.

The Water Quality Management Division carries out daily activities relating to Commission policies and programs. The Division is divided into four Sections: Grants and Program Management, Planning, Permits, and Surveillance and Compliance.

Water quality standards, municipal plans, construction grants, and tax certification are the main concerns of the Grants and Program Management Section. The Planning Section's activities include water supply planning, water supply standards, non-point source assessment, water quality assessment, and other planning functions. All water supply and wastewater construction permits are handled by the Permits Section, as is the NPDES program. The Surveillance and Compliance Section is active in wastewater monitoring and surveillance, operator certification, and field work.

The State Hygienic Laboratory (SHL) of the University of Iowa provides water quality and sample analysis for DEQ under contract. Part of the SHL work involves administering the Effluent Quality Analysis Program in which all dischargers send monthly samples to the Laboratory for analysis. SHL is also active in surface water quality and water supply analysis.

A major program effort of the Water Quality Mangement Division concerns non-point water pollution in conjunction with Section 208

planning. The seriousness of the problem is demonstrated by the fact that a Non-Point Water Pollution Advisory Committee was recently appointed to study the area and make recommendations. DEQ plans to work closely with the Department of Soil Conservation in dealing with such non-point sources as pesticide and fertilizer runoff, soil erosion, sewer overflow, and street and highway runoff.

B. Workforce Profile

The Water Quality Management Division is the largest branch of DEQ; it currently has a full-time staff of 58 persons. The following table presents a breakdown of staff positions by occupational category.

TABLE X

DEPARTMENT OF ENVIRONMENTAL QUALITY

Water Quality Management Division
Current (1976) Staffing Level

Position	1976
Engineer	27
Environmental Specialist	15
Administrator	2
Other	5
Clerical	9
TOTAL	58

Most of the engineers are either sanitary or civil engineers. Environmental specialists include scientists and planners. The "other" classification includes four program supervisors and one accounting technician. As noted previously the total staff of 58 is responsible

for both wastewater and potable water programs, but it is impossible to break the workforce contingent down into those two areas.

The SHL effort in water programs is shared by the Des Moines and Iowa City offices. Eight members of the SHL staff work almost exclusively in the potable water and wastewater areas as shown in the following table.

TABLE XI

STATE HYGIENIC LABORATORY

Water Program Personnel
Current (1976) Staffing Level

Position	1976
Chemist	2
Biologist	1
Technician	5
TOTAL	8

The SHL personnel commonly have advanced degrees or a great deal of experience in laboratory matters. Water quality chemistry, limnology, and effluent quality analysis are common areas of activity.

Iowa has an operator certification program designed to assure that operators of water supply and wastewater treatment facilities are well trained and proficient. Examination is required for certification and every treatment facility must be operated under the direct supervision of a certified operator.

There is a total of 4,361 certified operators in the state; 1,801 of these are in the water supply field and 1,660 are in the wastewater area.

It is not known how many of these persons are actively employed as operators, but during FY 1975 there were 396 new certificates issued and 2,651 certificates renewed. Operators are certified in categories of Grade I through Grade IV with Grade IV being the lowest. No information is available concerning the number of operators at each Grade.

C. Workforce Projections

Workforce projection information represents best professional judgments of water quality personnel. The water pollution and potable water fields have undergone significant changes in the past five years; this can generally be attributed to the 1972 Amendments to the Federal Water Pollution Control Act and the Safe Drinking Water Act of 1974. Because the full impact of this legislation is still being absorbed, there is some uncertainty as to future workforce needs.

Little growth is expected in DEQ water programs over the next five years as it is felt that most activities are adequately staffed. However, program priorities for the agency include a number of water activities, a fact which may portend some significant workforce growth in this area.

An eight percent per year staffing increase for all of DEQ has been projected. The following table is based on the assumption that similar growth will occur in the Water Quality Management Division across all occupations.

TABLE XII

DEPARTMENT OF ENVIRONMENTAL QUALITY

Water Quality Management Division
Workforce Projections to 1982 (est.)

Position	1976	1977	1978	1979	1980	1981	%/annum turnover (average)	%/annum growth (average)
Engineer	27	28	30	31	34	36	n/a	6%
Environmental Specialist	15	16	18	20	22	26	n/a	12%
Administrator	2	3	3	3	3	4	n/a	17%
Other	5	6	6	7	8	8	n/a	10%
Clerical	9	9	10	11	11	11	n/a	4%
TOTAL	58	62	67	72	78	85	16%	8%

Undetermined workforce needs may arise as Iowa fully implements its Safe Drinking Water Act requirements; a long range strategy is being developed during the current fiscal year. Section 208 planning is becoming more important in the state because of non-point water pollution. In addition, the NPDES program and the construction grants area are mentioned as high priority items. Implementation of these programs may affect workforce growth in both numbers and occupations.

SHL anticipates little workforce growth over the next five years with staff levels dependent in part on laboratory automation. Laboratory personnel expect to add two professionals and one technician in the potable water area and at least one technician in the wastewater field.

The number of certified operators in Iowa is expected to decrease slightly from the present level of 4,361 as training and qualifications

are upgraded. Not all certified operators are employed in that capacity, and fewer will maintain their licenses as more stringent requirements are imposed. The net result is expected to be a more professional organization with higher salaries and lower turnover. The largest number of operators will continue to be in Grades III and IV because the largest portion of plants in the state are lagoons. Training requirements and new facilities will virtually eliminate the use of part-time operators.

D. Training and Certification

Iowa DEQ has developed and implemented an extensive in-house training program, and one full-time person is responsible for coordinating staff training activities. Each employee of the Water Quality Management Division, and all other employees, is allowed one week of training per year. An attempt is made to include one management course, one technical course, and one conference in the annual training.

DEQ has developed a detailed and extensive water and wastewater operator training plan. Under this program it is felt that training will be much more thorough and basic courses will be available in all areas of the state. The Department of Public Instruction will assume a major portion of the costs, and participants will only be required to pay about one dollar per contact hour.

The training plan also updates the classification criteria for treatment facilities; a certificate corresponding to the facility will be required. It is hoped that the new training and certification system will improve facility operation and upgrade the entire operator profession.

E. Career Potential

Public sector careers in wastewater and potable water are expected to be limited over the next five years, although some programs being developed may call for a larger workforce. The number of facility operators is expected to level off and perhaps show a slight decrease.

Sanitary and civil engineers and environmental specialists are most likely to be needed for positions at the state level. Section 208 planning and new water supply mandates are expected to be the basis for future needs, and professionals experienced in these areas may be in demand.

Employment in operator positions may show a slight decrease, but persons with the requisite education and experience may still be able to find positions as the entire program is updated. There is likely to be some turnover, particularly as smaller communities switch to full-time personnel and more complex facilities.

F. Conclusion

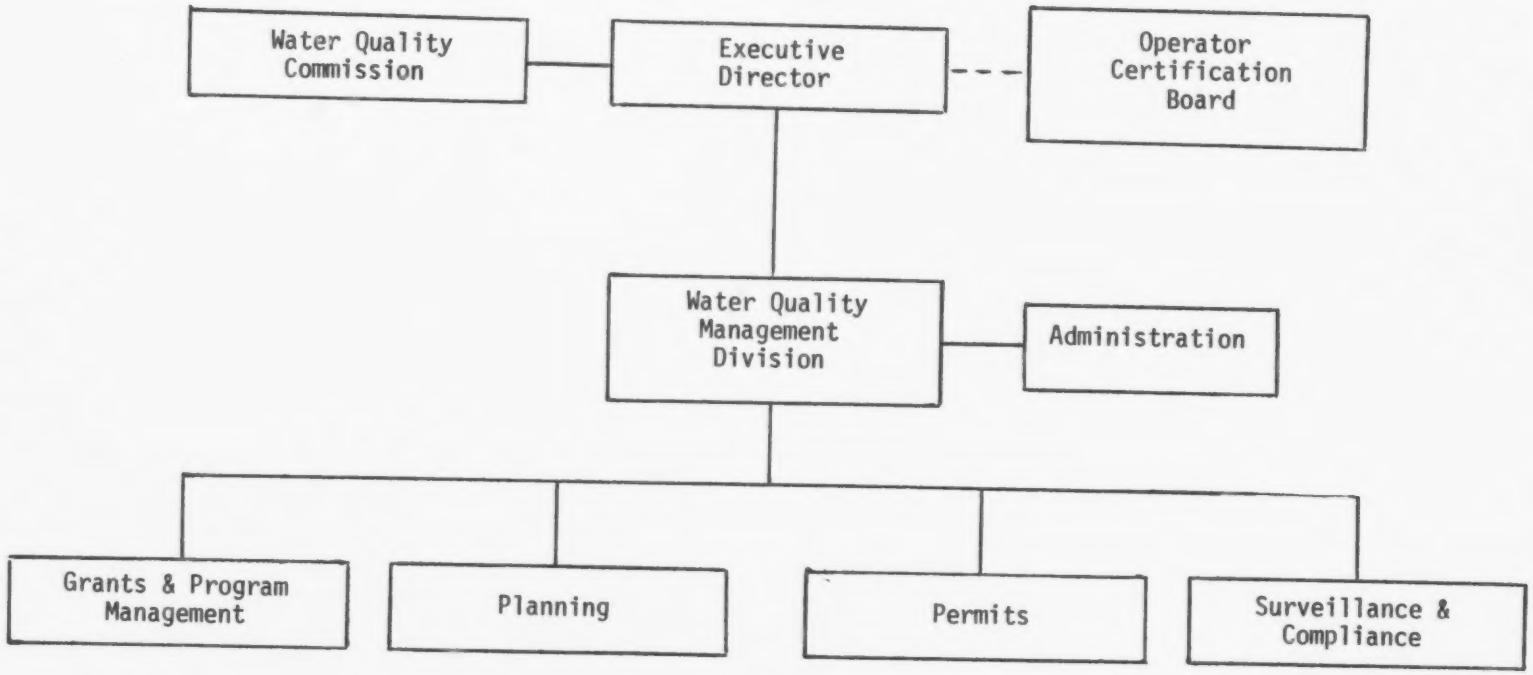
Iowa's new safe drinking water provisions and a more stringent operator certification program are two areas which will receive attention from DEQ water personnel over the next five years. Generally, it is felt that most programs are adequately staffed at the present time, although some growth for the agency as a whole will show itself in the Water Quality Management Division.

Engineers and environmental specialists are the major occupational categories in the Division, and this trend can be expected to continue. Staff support from SHL will eliminate the need for large amounts of money and personnel in laboratory matters.

IOWA DEPARTMENT OF ENVIRONMENTAL QUALITY

WATER PROGRAM

Figure 9



VIII. ENERGY

A. Introduction

The Energy Policy Council was created in 1974 to coordinate energy matters in Iowa and to unify the state's approach and response to future energy problems. The Council is composed of seventeen members as follows: seven public members, four legislators, the State Geologist, Chairman of the State Commerce Commission, Director of the Department of Environmental Quality, Secretary of Agriculture, Soil Conservation Director, and Department of Transportation Director. Certain duties of the Council are set forth in Chapter 93 of the Code of Iowa and include the following:

1) to annually prepare a state energy policy for submission to the Governor and Legislature;

2) to establish an energy data depository;

3) to prepare a quarterly report on the state's energy supply, demand, and conservation;

4) to review and recommend legislation relating to energy use and development;

5) to develop public education programs for energy conservation; and

6) to administer the state set asides of fuel under the federal Mandatory Fuel Allocation Program.

The Council can also determine that energy shortages or energy emergencies exist, and recommend to the Governor that an emergency be declared. Currently, the Energy Policy Council administers the Rail Branch Line Assistance Program for rail improvement programs throughout the state.

The Natural Resources Council is a nine-member board with a more limited role in energy matters. As an environmental area, this Council is concerned with water use and conservation; in the energy field it administers the state's oil and gas conservation law.

B. Workforce Profile

The Iowa Energy Policy Council is limited by law to a staff of seven and one-half permanent, full-time employees. There is currently a staff of seven persons; in addition, the Council has two VISTA employees and two people working under special project contracts.

The Council Director is the chief administrator for all program operations, and there are two clerical persons on staff. Also, there is a data collection specialist, a fuel allocation specialist and a research projects supervisor.

The conservation branch has a total of five persons employed in it. Current activities in this area include public school education, preparation of publications and press releases, and making information available to the General Assembly.

In addition to those people noted above, the seventeen-member Council provides professional expertise in policy formulation and program development. No attempt has been made to obtain workforce information for private energy fields or utility operations.

C. Workforce Projections

No growth is expected over the next five years for the Iowa Energy Policy Council for two reasons. First, budget limitations are expected to restrict hiring throughout the public sector. Second, the legislation creating the Energy Policy Council provides that the Council will go out of existence in 1979. While there is a good probability that the life of the Council will be continued, long range planning is difficult.

Some workforce needs will arise if a new fuel allocation program is imposed. Additionally, some needs may arise if a greater effort is made to mine Iowa coal; however, the coal is of poor quality and mining of it is not expected to be significant. Because these possibilities are quite speculative, it is difficult to make workforce projections at this time.

D. Training and Certification

Because Iowa is not a major energy producer, there is little need for formal permits or certification in this area. The small public sector workforce also means that few educational and training programs are required.

Employees of the Energy Policy Council generally attend seminars and conferences in the energy field, and they are strongly encouraged to attend as many seminars as possible. In addition, on-the-job training occurs for new entrants to familiarize them with the operation of the Council. Selected reading material is circulated among the staff on a weekly basis for in-house training.

E. Career Potential

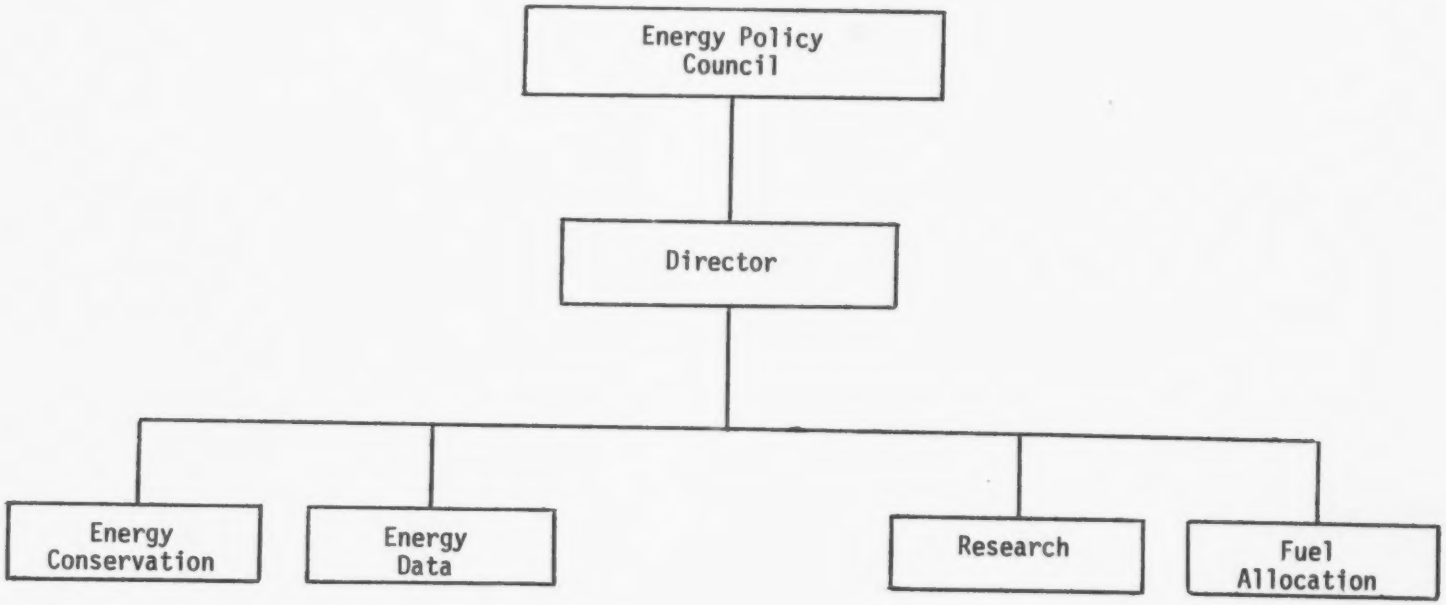
Career potential in Iowa's public sector energy workforce will be very limited over the next five years. Lack of assurance that the state's main energy agency will be in existence by 1980 could, in fact, lead to workforce and career reduction. However, while few new careers may develop it, it is likely that present conservation, research, and educational efforts will continue.

F. Conclusion

Iowa currently has a public sector energy workforce of only ten persons engaged mainly in conservation and education activities. Because Iowa is not a large energy producer, these are the types of functions that are likely to continue. Long range planning is, however, hampered because continuation of the Energy Policy Council beyond 1979 has not been assured. As energy supplies become more critical, allocation for heating and agricultural needs may become more crucial; however, the possible workforce implications of this and other actions cannot presently be determined.

IOWA ENERGY POLICY COUNCIL

Figure 10



Selected Post Secondary Institutions
With Formal Environmental Energy Programs

EDUCATION

Interest in environmental education programs is increasing in the State of Iowa. The number and variety of course offerings in institutions of higher education reflects a concern for abating pollution sources and protecting valuable natural resources. Luther College, Cornell College, Coe College and Briar Cliff College are some of the four-year institutions offering programs in environmental studies, environmental biology and conservation, and environmental sciences. Iowa State University and the University of Northern Iowa also offer environmental studies programs.

Environmental education offerings at Iowa's two-year institutions are more limited. Iowa Central Community College offers a degree in environmental control technology and Kirkwood Community College has programs in environmental health technology and water and wastewater technology. The Kirkwood program and Iowa State Universities sanitary engineering and water resources programs are dealt with in greater detail on the following pages.

SENIOR INSTITUTIONS

Iowa State University
Ames, Iowa

Program: Sanitary Engineering (B.S., M.S., Ph.D.)

Hours required for major: Quarter - (M.S.) 45
Program Inception: 1969
Staff Size: Twelve professors, three instructors
Enrollment: 16 (15 M.S., 1 Ph.D.)
Graduates (1976): 18
Placement: 100%
Graduate Work: Approximately 10%

Courses

Water and Wastewater Treatment
Design of Water Supply and Sewer Systems
Design of Sanitary Engineering Systems
Remote Sensing of Earth Resources and Environment
Water and Wastewater Analysis
Water Pollution Control Plant Design
Water Treatment Plant Design
Solid Waste Collection and Disposal
Advanced Treatment of Water and Wastewater
Advanced Topics in Water Pollution Control
Advanced Topics in Water Treatment

Program: Water Resources (M.S., Ph.D.)

Hours required for major: Quarter - (M.S.) 45
Program Inception: 1969
Staff Size: Twelve professors, three instructors
Enrollment: 17 (15 M.S., 2 Ph.D.)
Graduates (1976): 16
Placement: 100%
Graduate Work: Approximately 20%

Courses (in addition to those listed above)

Hydrology
Field Hydrology
Grand Water Hydrology
Multiple Use of Water Resources

Water Resources I
Water Resources II
Water Resources III
Advanced Topics in Water Resources Engineering
Applied Hydraulic Design
Special Topics

COMMUNITY COLLEGES/TECHNICAL INSTITUTIONS

Kirkwood Community College
Cedar Rapids, Iowa

Program: Environmental Health Technology (A.S.)

Hours required for major: 88
Program Inception: 1968
Staff Size: One department head, two instructors
Enrollment: 12 (normally around 20)
Graduates (1976): 6
Placement: 100%
Graduate Work: 0

Courses

Introduction to Environmental Health
Insect and Rodent Control
Private Wastewater Systems
Diseases of Man
Housing Inspection
Food Sanitation
Private Water Supplies
Principles of Microbiology
Occupational Health & Industrial Safety
Recreational Sanitation
Solid Waste Mangement
Air Quality Management
Milk Sanitation
Supervised Field Studies
Environmental Health Seminar
Man and His Environment
Environmental Health Administration
Planning and Zoning
Radiation Control
Public Water Technology
Public Wastewater Technology

Program: Water and Wastewater Technology (A.S.)

Hours required for major: 80
Program Inception: 1969
Staff Size: Three full-time and one part-time instructors. These instructors are also involved in workshop and upgrade training.

Enrollment: 12
Graduates (1977): 12
Placement: 12
Graduate Work: 0

Courses

Water Resources and Water Quality Control
Principles of Microbiology
Water Treatment and Distribution
Wastewater Treatment
Water and Wastewater Plant Administration
Research Projects
Principles of Management
Supervised Field Study

State Legislation

IOWA GENERAL

TITLE:

Environmental Quality Act
Iowa Code 455B

PURPOSE:

To create a department of environmental quality and to provide for a more healthful environment through control of air, water, and solid waste pollution and the control of radiation and pesticides.

DEFINITIONS:

GENERAL

1. Department
2. Executive director
3. Executive committee

AIR QUALITY

1. Air contaminant
2. Air contaminant source
3. Air pollution
4. Atmosphere
5. Emission
6. Commission
7. Person
8. Political subdivision

WATER QUALITY

1. Sewage
2. Industrial waste
3. Other waste
4. Water pollution
5. Sewer system
6. Treatment works
7. Disposal system
8. Detergent
9. Water of the state
10. Person
11. Commission
12. Effluent standard
13. Point source
14. Pollutant
15. New source
16. Schedule of compliance
17. Sewer extension
18. Water supply distribution system extension
19. Production capacity
20. Public water supply system
21. Maximum contaminant level

DEFINITIONS (Cont'd):

WATER TREATMENT

1. Board
2. Commission
3. Certificate
4. Water supply system
5. Water treatment plant
6. Wastewater treatment plant
7. Water distribution system
8. Operator

SEWAGE WORKS

1. Treatment works
2. Commission
3. Construction
4. Eligible project
5. Municipality
6. Federal pollution abatement assistance

SOLID WASTE

1. Public agency
2. Private agency
3. Sanitary disposal project
4. Solid waste
5. Commission
6. Litter
7. Discard

RADIATION

1. Radiation
2. Radioactive material
3. Nuclear waste disposal site
4. Commission

PESTICIDES

1. Commission
2. Agricultural chemical
3. Pesticide
4. Plant growth regulator

ADMINISTERING AUTHORITY:

Department of Environmental Quality
Air Quality Commission
Water Quality Commission
Chemical Technology Commission
Solid Waste Disposal Commission
Board of Certification

AUTHORIZATIONS:

To issue regulations for the purposes of the act;
To enter and inspect property in enforcement of the act;
To develop a comprehensive air pollution abatement and control program;
To establish air quality and emission standards;
To issue pollution abatement orders;
To act as the state lead agency in air pollution matters;
To administer a permit program for air pollution equipment installation and new source construction;
To conduct air pollution studies;
To approve local air control programs;
To develop a comprehensive water pollution abatement and control program;
To establish water quality and effluent standards;
To control phosphate detergents;
To approve disposal system plans in conjunction with a permit program;
To classify all water and waste water treatment facilities;
To certify water and waste water facility operators;
To administer a sewage construction grant program;
To approve and certify city and county sanitary disposal projects;
To generally supervise solid waste disposal;
To control the transportation, storage and handling of radioactive material;
To approve all nuclear waste disposal sites;
To coordinate the regulation of agricultural chemicals;
To declare pests and control pesticide use;
To conduct the state public water supply program;
To act as the state lead agency in water pollution and drinking water matters.

CERTIFICATION OR LICENSING:

All water treatment, water distribution, and waste water treatment facility operators must be certified according to facility classification; examination required; provision made for prior operators.

PROHIBITED ACTS:

To violate any air quality or emission standards;
To violate the terms of any permit;
To discharge raw sewage;
To cause or allow water pollution;
To operate a water treatment plant without certified operator;
To dispose of solid waste other than at a sanitary disposal facility;
To discard litter onto land or water of the state;
To violate any other act provision, regulation or order.

EXEMPTIONS:

Disposal of own solid waste on own land

PENALTIES:

Water violations - fines of up to $5,000 per day; willful water violations - fines of up to $10,000 per day;
Other violations generally constitute a misdemeanor.

IOWA PESTICIDES

TITLE:

Pesticide Act of Iowa
Iowa Code 206

PURPOSE:

To provide for the control of pesticides and to undertake a program of applicator certification.

DEFINITIONS:

1. Active ingredient
2. Adulterated
3. Antidote
4. Certified applicator
5. Certified commercial applicator
6. Certified private applicator
7. Commercial applicator
8. Department
9. Device
10. Distribute
11. Hazard
12. Inert ingredient
13. Ingredient statement
14. Label
15. Labeling
16. Misbranded
17. Permit
18. Person
19. Pesticide
20. Pesticide dealer
21. Plant growth regulator
22. Public applicator
23. Registrant
24. Restricted use pesticide
25. Secretary
26. State restricted use pesticide
27. Under the direct supervision of
28. Unreasonable adverse effect on environment

ADMINISTERING AUTHORITY:

Department of Agriculture
Chemical Technology Commission

AUTHORIZATIONS:

To issue regulations pursuant to the act;
To enforce the act;
To classify pesticides and restrict their use;
To enter and inspect property in enforcement of the act;
To control pesticides and labeling;
To establish certification standards;
To categorize commercial applicators;
To certify commercial and private applicators;
To license pesticide dealers;
To require pesticide registration;
To investigate pesticide accidents and incidents.

CERTIFICATION OR LICENSING:

All commercial, public and private applicators must be certified; exam required for commercial and private applicators. Dealers must be licensed.

PROHIBITED ACTS:

To apply restricted pesticides or engage in the business without proper certification;
To sell pesticides without a license;
To fail to register pesticides;
To alter pesticide label in any way;
To violate any other provisions of the act.

EXEMPTIONS:

Governmental research activites.

PENALTIES:

Sale of unregistered pesticides - fines of up to $100;
General violations, first offense - fines of up to $500;
subsequent offenses - fines of up to $1,000.

IOWA ENERGY

TITLE:

Energy Policy Council Law
Iowa Code Ch. 93

PURPOSE:

To provide for a state policy for the development, utilization and conservation of state energy sources, and to create an energy policy council.

DEFINITIONS:

1. Council
2. Energy
3. Supplier
4. Director

ADMINISTERING AUTHORITY:

Energy Policy Council
Department of Transportation

AUTHORIZATIONS:

To prepare an annual state energy policy regarding development, utilization and conservation;
To recommend energy legislation;
To coordinate state agency energy allocation and needs;
To maintain a depository of energy data;
To administer grants for act purposes;
To declare and determine energy shortages and emergencies;
To encourage and improve railway services and trackage.